SOCIAL MEDIA IMPACT ON HEALTH PROFESSIONAL EDUCATION

Abstract

The integration of social media into health professional education has emerged as a transformative force, reshaping traditional learning paradigms and enabling new avenues for collaboration, information sharing, and professional development. This chapter offers an in-depth exploration of the significance, evolution, and multifaceted impact of social media on medical education. Beginning with an introduction and the rationale for its inclusion in health education, the chapter highlights the growing relevance of social media tools in modern learning environments, especially in promoting student-centered and self-directed learning. A brief historical overview traces the evolution of social media and its gradual adoption in medical education. The core section presents a comprehensive analysis of current protocols, platforms, and methodologies, examining both advantages and disadvantages. Benefits such as expanded access to medical information, improved communication, and collaborative learning are balanced against challenges like misinformation, privacy concerns, and potential distractions. The chapter also details the specific roles of popular platforms including Twitter, YouTube, LinkedIn, and Edmodo, analyzing how each contributes to learning and professional engagement. Ethical considerations surrounding patient privacy, professional conduct, and the responsible use of digital content are also addressed. Furthermore, the chapter explores the role of social media in continuing medical education and highlights instances where it has facilitated the dissemination of medical breakthroughs. Future trends are examined, including curriculum integration, the influence of emerging technologies, and the need to address digital inequities.

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I. INTRODUCTION

Modern day technologies in forms of social network services such as Facebook, Twitter or Instagram have become an important tool for individual and organizational communication.[1] These platforms allow users to interact with one another and build relationships. With the time, the use of social media has become an integral part of health professional educator's life.[2] Now, in the ever-evolving world of healthcare, even an increasing number of healthcare professionals and practitioners from diverse disciplines are actively embracing and harnessing the power of these groundbreaking platforms and invaluable resources.[3, 4] They are utilizing them to not only aid patients, but also to elevate the quality of medical care provided and to disseminate crucial medical knowledge and educational materials in a significantly more efficient and easily accessible manner, ultimately leading to the enhancement of overall healthcare outcomes for all.[4]

I have chosen to write on this topic as I believe that understanding the current role of social media and its impact on medical education is an important step in embracing the use of social media for research, healthcare workforce and for the patients. Well, unlike information on purely academic sites, information on social media can be more interactive. For instance, we can "tweet" an article on Twitter, share it with friends on Facebook, or comment on it in a blog. Social media and medical education are two interrelated terms and the use of these technologies is being incorporated in medical education as well.[5] Social media has become a foundation of big collaborative and cooperative learning and it also enhances the development of critical thinking.[6, 7] Social media technologies can also provide additional vehicles for learning which goes beyond traditional classroom based instruction. On the other hand, it also helps improving the communication and knowledge sharing as well. By providing a platform for a symposium for a broader audience, it can also foster great discussions. Through these types of interactions, students can develop better communication skills and more abilities when they are trying to solve problems. On the other hand, the health care industry recognizes the opportunities that information sharing on social media may present. For these reasons, the health care sector is making significant investments in technology and process innovations to take advantage of these new tools.[2, 8]

Finally in this monograph, an attempt has been made to understand the impact of social media in medical education as well as to discuss the evidence based importance of social media in medical education with its advantages and disadvantages at this juncture. At the same time comprehensive evidence is sought to assess the most appropriate social media tool to enhance teaching and learning experiences based on educational outcome.

1. Definition of Social Media

Social media can be defined as "a group of internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content.[9] Social media enables the users to create highly interactive platforms through which individuals and communities can share, co-create, discuss, and modify user-generated content. There are a number of key features and concepts inherent in this definition. Firstly, social media relies on the development of web-based technologies. It draws on the development of the World Wide Web which was created in 1989 and was originally just a means of exchanging static documents.[10] However, starting

from roughly 2004 with the launch of Facebook and the growth of Web 2.0, social media has begun to transform the nature and structure of the internet. Web 2.0 is a term that was coined in 1999 to describe websites that utilize technology beyond the static pages of earlier websites. However, it has since become a useful shorthand for describing newer methods of creating and working with digital media on the internet. These newer methods are characterized from the traditional 'top down' manner in which 'experts' delivered information to the public in a one-way conversation such as the model used in the traditional mass media of television and newspapers. Instead, these newer methods, typically associated with social media, enable 'peer to peer' or 'many to many' communication.[11] Users are now not only able to access information but easily produce their own and customize information to a particular audience. Secondly, social media is fundamentally a group-based discourse. The applications allow the creation and exchange of user-generated content which is then used to engage in social discussion and interaction.[12] Thirdly, the definition emphasizes the collaborative and interactive nature of social media platforms. These web-based applications enable the users to become active and creative producers of content which can be shared across different sites and platforms. This content is referred to as user-generated content and can take many different forms, such as text, information, video, and images. It is the creative potential and scope of user-generated content that triggers such a diverse range of discourses and supports different styles of communication. Social media and its definition thus have substantial implications for both health educators and professionals because it enables 'non-experts' to participate in public debates and share innovative forms of practice, as well as giving the public a more active role in defining and making decisions about the delivery of healthcare services. Kaplan and Haenlein's[9] definition of social media is the most widely cited in academic literature concerning the topic. "User-generated content": this term refers to the multimedia digital information which is made publicly available on the internet and which is produced by users of online platforms. It is this user-generated content that forms the basis of communication and interaction in social media platforms. There are two main categories of user-generated content. The initial type pertains to publicly accessible information that is generated by individuals who are not affiliated with any organization, and it is separate from private data. Furthermore, user-generated content includes a wide range of media such as text, images, videos, and audio recordings. This content is typically produced by ordinary people and can be found in various online platforms such as social media websites, online forums, and blogs. Its purpose is to offer individuals a means to express themselves, share their opinions, and engage with others on a global scale. User-generated content has become increasingly prevalent in today's digital age, shaping the way people communicate and interact with each other.

2. Overview of the Topic

The topic of social media in medical education is a vast field and we are going to discover many options which relate to how we can utilize social media in teaching. In this monograph,

- We tried to explore what is the current practice of social media and what is the role of social media in medical education?

- We will discuss some historical views of social media in medical education and we will also learn how social media changes the world and how medical education adopts it.

- We will also see what the advantages and disadvantages of social media are.

- In addition to that, what is the impact of different resources on social media and its impact on medical education? We will also see some social media resources. How does the hierarchy of evidence affect social media and medical knowledge? And most importantly, we can't deny that medical knowledge is always dynamic, so how does social media help physicians to keep in touch with knowledge and what are its implications for the curriculum?

- Then, last but not least, we will see some future considerations of social media in medical education and we will see how students and teachers create knowledge of the community by changing their own practices in medical education. Also, this will give us the picture that in the future we may rely on this sort of resources and may adopt social media resources properly according to that.

II. IMPORTANCE IN MEDICAL EDUCATION & ITS RELEVANCE

Social media has revolutionized the way in which we seek and share information. With increasing number of people becoming active on social media, its use has been pervasive in many fields including medical education.[13] It has found a variety of applications in medical education and is certainly a great tool for the students and faculty. Its relevance comes from the fact that it changes the dynamics of formal structured learning, and places the onus on the learner to tap into the vast amount of resources that is available at any given point in time over the internet.[14, 15] This, in addition to providing the reinforcement for faculty guidance from a real time aspect, allows individuals to tailor their learning experience based on their individual needs and interests. Also, social media provides the opportunity for the users to interact and collaborate, be it through the various thematic discussion forums, via YouTube for the sharing of multimedia resources, or even simple generic class discussion forums.[4, 14] Such collaboration is vital in today's learner-centric methodologies such as problem-based learning, wherein students explore knowledge in a more practical sense, and learn to quest for underlying principles, thus better preparing them for lifelong learning. Furthermore, the most attractive feature of social media refers to its ability to provide instantaneous up-to-date information. Be it a faculty member, a student or any other health professional, information with either text or multimedia content can be shared and in turn responded and commented upon by fellow colleagues. This functionality is especially useful in the case of sudden emergence of a new and acute illness outbreak worldwide, where access to information is limited. With the use of social media, contemporaneous knowledge sharing via platforms such as YouTube allows recording and dissemination of rapid tutorial videos - something that cannot be achieved using traditional means of education. [16, 17]

III. BRIEF HISTORY

Social media use in medical education is a relatively new field, and it was described in the literature for the first time in 2008, with the experience of using Facebook in a first-year medical anatomy.[18] However, it wasn't until a few years later when social media really emerged as a powerful phenomenon in our daily life. From a medical education perspective, the history of social media can be divided into two distinctive eras: the web 2.0 era and the mobile era. The term "social media" first appeared in the literature in 2005, and it referred to

a web-based platform that allows the creation and exchange of user-generated content. In 2006, Betsy and Maggie, two pharmacy professors from the University of Florida, mentioned the learning potential of web 2.0. 2008 was an important year because, in the same year, Hwang and his team published a paper in Cell Biology Education, introducing the use of Facebook in medical education for the first time. It's interesting that the Facebook group was perceived as a platform for active and data-rich communication and collaboration. In the mobile era, from 2010 to the present, we have witnessed the soaring popularity of portable electronic devices: smartphones and tablets. This revolutionary change in our digital habits has a profound impact on the way how we consume and interact with social media.[19] In a very short period of five years, mobile social media completely dominate the landscape: 2013, for the first time, the number of mobile users overtook the number of desktop users. Now, with better design, faster browsing experience, and instant communication, more and more medical educators switch to mobile-friendly social media tools, such as Twitter. With the widespread use of mobile social media among medical students and faculties, a number of studies began to explore the motivational factors of their usage and the impact on student engagement and interaction.[15, 20, 21] Specifically, researchers found that most of the users use social media as an interactive communication platform. It allows students not only access the up-to-date medical news and information but also engage actively in discussions and express their own opinions. These findings shed light on the possibilities of creating a more learner-centered and interactive curriculum, with the support of mobile social media. It demonstrated that the integration of social media in medical education is moving from simple knowledge transmission to a more collaborative and personalized model of learning. From practice, in reality, to study, and then to a new direction of digitalizing medical education, the development of social media in medical education reflects and guides the paradigm shift of educational philosophy and pedagogy in general. Also, the increase of educational research in this area will undoubtedly produce useful evidence and insight to inform productive use of social media for teaching and learning. Very soon, we are about to witness the digital, mobile-savvy medical teachers challenging the traditional hierarchy and bureaucracy that have long dominated medical education and professional development.

IV. RATIONALE

The development of modern technology has afforded individuals with many liberties and conveniences, ranging from ease of travel to effortless information access to personalized navigation. This vast digital expanse is not without its drawbacks, however, particularly as social and online spaces begin to pervade professional work and even education. Concern and scrutiny understandably develop. Therefore, as a relatively new and developing field of research, it is fundamental to explore the ways in which digital online spaces have and continue to impact professional work and education. This includes discussing the potential merits and challenges and considering the societal and ethical implications involved in this type of research. As such, with the topic revolving around the role of social media in medical education, the present research adopts a critical, reasoning-based argument in which both the positives and negatives are systematically weighed. The focus on this monograph is to investigate the ways in which social media today has impacted and reformed, and how education in the medical field is approached. There is a specific curiosity to explore the student and professionals' side of the argument, whereby contemporary and digital online methods are favorable versus the traditional systems currently still in place. As an advocate for digital methods such as e-learning, it is interesting and important to challenge and develop

this research theme so that a balanced, informative judgment may be delivered. Notably, discussing modernization and progression in any professional field is always going to be laced with ethical and societal debate. And appealing to Digital Sociology, the present research's logic is able to stand strong by offering an essential, critical outlook into perhaps where the future of medical education is leading. By establishing these contexts in the rationale, there is an understanding and confidence that the research will contribute effectively to a field of unfinished, modern, and critical discourse when trying to blend digital platforms with professional medical education.

V. COMPREHENSIVE ANALYSIS OF CURRENT PROTOCOLS AND METHODOLOGIES UTILIZED IN THE FIELD

1. Advantages of Social Media in Medical Education

Social media platforms offer several advantages in medical education. They facilitate knowledge sharing among students and the public, allowing for the dissemination of information through stories, videos, and educational games.[22] Social media platforms like Twitter are particularly useful in building communities, discussing journal articles, and sharing research work, which enhances networking and collaboration among medical professionals.[23] Additionally, social media provides opportunities for informal learning and peer-to-peer knowledge exchange.[24] However, it is important to note that the excessive use of social media can contribute to addiction, anxiety, and diminished self-esteem.[25] Therefore, it is crucial to consider both the positive and negative aspects of social media when utilizing it in medical education.

Social media has several advantages in medical education.

- It allows for content sharing, collaborative modification, and interaction, making it a valuable tool for teaching and learning in medical education.[26]

- Social media platforms can be used to deliver educational content to medical trainees, improving asynchronous learning and supporting physician development.[27]

- Social media can be used as an educational tool in postgraduate training, providing access to international networks and facilitating social education.[28]

Summary: Another advantage of social media in medical education is enhanced communication between medical professionals. This was reported in a recent study conducted by a team from Ireland, where they found that the use of a closed Facebook group improved communication between medical professionals both formally and informally. This not only allowed students to ask more questions and gain valuable feedback from their peers and their tutors, but it also meant that tutors could use social media to better communicate amongst themselves for the purposes of teaching and learning. This kind of communication, which uses social media, facilitates the exchange of ideas and the open discussion of challenging topics. However, what is truly novel about using social media platforms to communicate between medical professionals is that it means students have the potential to receive quick and personalized feedback. Quick replies over social media networks have the potential to ensure that the rate and the relevance of interactions remain high, leading to better learning

outcomes for students. The analytics data of how well a certain e-learning tool or technique is working can be viewed in real time – something which is not possible for many traditional formative assessments. With the high level of interconnectivity and data sharing offered by social media platforms, this could lead to entirely new and evidence-based ways for educators to measure the effectiveness of their online teaching. Also, the use of social media in communications removes the need for students or tutors to travel in order to meet, which has the added benefits of saving time and being more sustainable.

❖ **Access to a Vast Amount of Medical Information**

Access to a vast amount of medical information can be viewed as one of the most important advantages of social media in medical education. It is widely accepted that research and evidence-based practice are the main pillars of medical science. Therefore, availability and access to the latest up-to-date medical information is important for the medical professionals and especially the medical students. With the help of internet and social media, the process of searching and finding the necessary up-to-date medical information has become a lot easier. There is a multitude of different platforms that could be used in order to access different types of medical information.

Shah M H et al.[29] recommended that the social media provides access to a wealth of educational materials, such as podcasts, videos, and webinars, which can supplement traditional forms of medical education. Chaudhari M et al.[30] stated that the emergence of various social media applications and web-based resources provided us with more collaborative approaches to medical education, however, implementing new technologies also creates new challenges and opportunities for students and faculties. Folaranmi O O et al.[31] proposed that the social media platforms provide readily accessible, free, high-quality information to pathologists and trainees through academic discussions, quizzes, journal clubs, and informal consultations.

For example, students can search and follow various well-known medical journals which would let them have the most recent editions of the journals. Also, by registering and following different medical organizations and associations on social media platforms, students can be kept informed in the field of medical news and updates. One of the many ways that social media and technology is benefiting the field of medicine is the speed at which change and new knowledge occurs. For example, in the UK, the National Institute for Health and Care Excellence [32] (NICE) provides evidence-based guidelines which are widely used by physicians to manage different diseases. However, guidelines are in a constant cycle of being reviewed and updated, thus it is highly important for the healthcare professionals to keep up with such a speedy change. By engaging in social media, it is possible for medical students and professionals to enroll in different online casuistry discussion groups to interchange their experiences and to debate the strengths and weaknesses of the current medical practices. This is an important aspect of learning and it helps students to look at areas of clinical practice that could be improved or expanded upon. Also, this will let students enrich their education and help them to grow not just in knowledge, but also in practice.

❖ **Facilitation of Collaboration and Knowledge Sharing**

Another key benefit of social media in medical education is that it promotes collaboration and knowledge sharing among students and even faculty members. Based on the unique process of learning, which is independent yet critically self-reflective, peer-supported and social media enhanced learning activity (such as creating, exploring, networking, goal-setting and cognitive presence) help to develop and transform a personal learning environment so as to become an academic and scholarly community.

Qader M A et al.[33] highlighted the use of Free Open Access Medical Education (FOAMed) tools, specifically a Twitter-based journal club called #IPNAJC, as a means to improve educational equity and networking opportunities in the medical field. The #IPNAJC successfully achieved equal participation across Europe, Asia, and South America, with live chats conducted in different time zones to accommodate participants' convenience.

❖ **Enhanced Communication between Medical Professionals**

Improved communication between doctors is a marked advantage of social media. This enables doctors to seek second opinions from the other side of the world without having to wait for conferences or special meetings. Some examples of such websites designed to connect doctors and medical researchers include "Sermo". It's evident that this form of collaboration cannot exist without the communication features of social media. In 2013 it was reported that members from 'Sermo' were able to solve a complex case of Balo's concentric sclerosis. The literature regarding this condition suggests that patients will typically decline within a few months of the first signs of the disease but with this rare form of Multiple Sclerosis, the decline is usually much more rapid resulting in death within around four months. By exploiting the features of medical-based social media, researchers were able to record the case and, over time, multiple scans and discussions resulted in there being a substantial amount of new data that suggested Balo's may in fact be a treatable condition and not as lethal as previously recorded. This type of success story is simply another example of the potentials of enhanced communication through social media.

2. **Disadvantages of Social Media in Medical Education**

The number of drawbacks associated with social media in medical education are well documented, and they have to be taken seriously, because if we are to fully embrace the use of social media in medical education, we need to find ways to mitigate such effects. For example, when social media first started to become popular, some commentators feel that it was some sort of technological utopia, where people could share ideas and knowledge unchecked and freely, that everyone, everywhere, would have access to the same information. However, as time has gone on, it is clear that there are a small number of people who engage in spreading the wrong kind of information, perhaps because it helps fuel their own beliefs, or perhaps due to some other nefarious reason. This is a concern in medical education, as it could be the case that studying the wrong kind of research material, or using biased sources, could have a detrimental effect on a person's learning and development. Further, the openness and public facing aspect of social media means that another major issue is the privacy and security of not only the user but the information that is being discussed and shared too. For example, medical students and professionals often deal with sensitive personal and patient

information, and so there is a need to maintain confidentiality. When things are posted online, they are on there forever and such information that is posted could easily be breached, misused or accessed by an unauthorized person throughout its lifetime, potentially causing significant issues in terms of the submission with the Data Protection Act and other relevant laws.[34] Also, because social media platforms are typically set up so that they are easy to use and people can interact with one another frequently, this could lead to colossal amounts of time being wasted when students and teachers are using social media during teaching. This is an issue which is not unique to social media; even the use of a PowerPoint in teaching can generate discussion about the effectiveness and to what extent it engages a classroom. However, it has been statistically shown that social media is a significant contributing factor to reduced productivity in a classroom and indeed in a working environment. For example, a study by the University of Swedish found that 90% of students surveyed believed that it was easier to concentrate in a classroom without the distraction of social media.[35] These are all genuine concerns however creative and innovative the use of social media may be, and as the evidence seems to suggest there is greater scope for establishing the merits of social media in relation to medical education as opposed to e.g. medical education. Well recognized and proven systems and methods still dominate the teaching of future medical professionals nowadays. Social media integration is different from a simple incorporation of already established mediums e.g. PowerPoint or interactive whiteboards; it fundamentally requires a different mindset when thinking about how to effectively deliver medical education. However with this in mind, it may be that the effective use of social media is not so much about establishing a complete reliance on it, but by sheltering those who use it safely and responsibly in an educational context. This mirrors the real life expectations on medical professionals to engage in a proper and responsible use of medical social media, and as such it may be the case that a greater emphasis on the teaching of social media familiarity and the associated ethical responsibilities is placed upon medical education from the outset. As it stands, the current medical education curriculum does not typically incorporate learning about social media, but perhaps in light of recent findings and research in this area, it will become something that not only future medical professionals could benefit from, but the patients who seek out their expertise to.

❖ Spread of Misinformation and Unreliable Sources

The lack of regulation of content on social media means that incorrect medical information can be easily spread. For example, in 2020, an anonymous anti-vaccine group bought an advertising slot on social media, specifically targeting women in a certain age group.[36] This meant that thousands of women were provided with a link to a site spreading unfounded claims about the risks of vaccines in pregnancy. This could never have happened with traditional, more regulated forms of media. Due to easy accessibility and the short attention span of internet users, incorrect medical information, such as "medical treatment for dizziness", is read and shared many times on social media opposed to evidence-based information, like a selected article from the Cochrane library, resulting patients to suffer from misdiagnosis and diseases being left untreated. The wealth of user-generated content found on social media raises questions as to the reliance of such platforms for evidential and accurate resources. In particular, the websites of health institutions and journals are curated by specialist professionals and are subject to strict guidelines. A new application of social impact in Social Media for overcoming false Information in health was recently created by a research.[37] The Italian National Federation of Orders of Surgeons and Dentists has

developed a web tool called "dottoremaeveroche" (DMEVC) in collaboration with the University of Florence (Italy). This tool aims to combat the dissemination of misinformation and fake news related to health information management.[38] The philosophy was predicated on the idea that health-related messages that contain inaccurate information tend to be aggressive, whereas those that draw on data about social effect are transformational and courteous. Conversely, the accuracy of content on social media is largely determined by the creator and standards can be very low. Furthermore, information found on social media is likely to be heavily biased towards the newest treatments or diagnosis strategies, in contrast to the use of traditional databases and libraries that store information which is constantly reviewed and revised by professionals. As a result, patient safety is jeopardized by reliance of doctors on unfounded or inaccurate information found on these platforms. This demonstrates the elevated risks associated with the use of a platform founded on the principles of mass content creation and shares and supports the claim that social media platforms have facilitated the increased spread of misinformation.

❖ **Privacy and Security Concerns**

However, another issue is that social media blurs the lines between what is private and what is public. This raises important questions about the nature of consent and the need for robust ethical guidance for how shared health data is managed and protected in an increasingly digital age. These privacy and security issues have led some medical schools, such as Harvard, to implement policies advising students against using social media for the sharing of patient-related materials. This has raised concerns that such policies could prevent students from benefiting from the educational aspects of social media and could stifle innovation in teaching. There are, of course, careful and responsible ways in which social media can be used as a teaching aid that do not put patient information or the students themselves at risk. For example, by using closed, university-affiliated platforms and anonymizing patient data, educators can take advantage of the collaborative potential of social media, as well as simulating real-world experiences of methods of communication within a healthcare team.[39]

Some of the most popular social media websites, such as Facebook, Instagram, Twitter, LinkedIn, and WhatsApp, all have their own privacy policies and terms and conditions. However, many users do not look into or fully understand these policies. They may not realize, for example, that when they upload photos to social media, they are usually granting the platform a broad and irrevocable license to use, modify, and distribute those pictures. When using social media to exchange information about patients, it is essential for medical professionals to comply with data protection legislation and guidance.

❖ **Potential for Distraction and Time-Wasting**

Although this could be interpreted as a problem to medical staff as well as students, the long-term focus is on maintaining a healthy learning environment for professionals of the future. With image sharing platforms such as Snapchat and Instagram becoming ever increasingly popular among medical professionals as a way to network and share resources, the medical community will need to be more amenable with this revolution in social media. With medical educational teaching and learning practices not currently equipped to provide meaningful learning, sharing, and investigating experiences on platforms like Instagram in the same way that they harness those features on existing learning platforms, such as Blackboard. This may

leave students at a disadvantage in the future. When people struggle to split their attention and try to multitask but are continually distracted by unwarranted emails, texts, etc., it can actually cause a 10-point fall in IQ, according to this report.[40]

Dopamine can also become a health problem in the long run, suggesting that the consistent and excessive release of it can lead to serious health issues such as depression, migraines, and attention deficiency disorder. Dopamine is a 'reward system' neurotransmitter, meaning that the release is part of a mechanism that focuses our attention on receiving the next reward. Over time, the brain's 'search for fulfillment' becomes excessive and starts to reduce the influence and sensitivity of other important neurotransmitters such as serotonin and oxytocin. These are of huge importance to a person's physical and mental wellness as they contribute to overall happiness, good moods, and emotional intelligence.

The brain scans of many people addicted to social media look similar to those addicted to drugs.[41] Every time you post, share, 'like', 'comment', send a message; your brain releases a neurotransmitter called dopamine. This substance has been called the 'feel-good chemical', because it creates a pleasurable sensation. This has led to a self-esteem enhancing social media loop. When we get a 'like' on our posts we get a little dopamine boost making it pleasurable and therefore increasingly habitual. This can not only make it overly addictive, but can also lead to narcissistic tendencies.

Another study looked at the effects of 'Facebook and visuospatial working memory'. Participants were divided into three groups. One group was mentally taxing them. The results showed that the group who had the Facebook window open for the 12-minute period scored statistically significantly lower in the ability to focus on the task.

Staying focused can be a challenge with the potential for constant digital distractions. Messages, alerts, and the addictive nature of social media platforms can make it difficult to concentrate and may lead to shorter attention spans. One study found that the average human attention span has fallen from 12 seconds to eight seconds – lower than that of a goldfish.[42]

3. Role of Social Media Platforms in Medical Education

The concept is also known as mobile learning or e-learning, and today, students are given access to digitally accessible collections. Knowledge portals not only facilitate the delivery of training and teaching material, but it also simplifies the management and operation of learning. It also provides great opportunities for training and education in environments like healthcare. By using social networks, the advantages these platforms provide can be transformed into healthcare education and developed into a new educational architecture. In addition to traditional classroom-based sessions, this will lead to the completion of more interactive, specialized, and useful skilled training for healthcare professionals.

Over the past few years, there has been a significant increase in the use of modern social media in educational settings. Ranging from professional training to medical awareness, these platforms have become the primary means for individual engagement. Particularly in the rapidly evolving healthcare sector, which is inundated by vast information resources, various applications and software tools are developed to deal with the latest healthcare technologies. Information technology resources are quantitatively and qualitatively advancing at a rapid

pace. This progress results in extensive research interest to utilize these potentials in various fields such as medicine.

❖ **Twitter and its Impact on Medical Discussions**

Twitter is best recognised for 140-character "microblogging" messages. Twitter may be complicated and intimidating for digital immigrants due of its distinct language. Twitter conversations are now used in medical education. A Twitter chat is a regulated discussion on a specific topic. Twitter users may join the conversation by following the hashtag-related tweets or simply tweeting with the hashtag. All in all, Twitter receives mass attention in terms of its effectiveness for developing professional networks in the establishment of contemporary medical education, communications, and research for doctors. Many successful stories are down to the social media movement to attract public opinion and spread out the pace of reform, such as Canadian healthcare reformation as doctors convene over Twitter to aid the policy, some of which are underacted in practice nowadays area.[43]

For example if we do a hashtag tweet search - in this particular case "#headache" which is a common symptom frequently presented to GPs - numerous results and latest replies could be found, meaning that patients' information could be shared among patients and experienced advice could be generated from the GPs who actively linked the best interest and treatment for the patients visually.

Grid Layout: Grid Twitter layout is a great source of quick and easy to find information about medical matters. A study at the University of London found that hospitals in London formed a connected network having higher news exchanges than the regular news output and successfully detected both temporal and spatial oddities. Such a unique study reveals that understanding the spread of information embedded in the connections of the tweet could provide a practical source for medical guidelines and a rapid response for information replying.

The power of Twitter lies in its use of hashtags. Doctors and medical students actively participate in weekly tweet chat sessions like "HealthXPh" and most commonly attend "#meded" Twitter chats. Studies have found that medical schools and researchers can utilize the Twitter platform to find potential collaborators and explore recent research.[44] Also, Twitter provides a fantastic platform where doctors could tell the wider population about issues facing the National Health Service, as well as discuss anonymously and with limited fear of repercussion within forums. A good example is #NHSchangeday where doctors were able to support the changes.[45]

❖ **YouTube and its Role in Medical Education Videos**

Healthcare professionals often come across conditions and ailments that may be ultra-rare. Traditionally, there are platforms like PubMed, Medscape, and UpToDate where doctors can find medical educational materials for various questions in their mind. But the information on the commonly known platforms is typically scattered and has no appeal to the visual memory of the viewer. In addition, most of the educational materials are designed for patients instead of healthcare professionals. YouTube is a well-established platform where people share and learn knowledge about specific subjects through video media. The videos, as well as the

viewers' analytics, can be used to track and estimate the effectiveness of the video in manipulating the memories of the viewer. This is particularly important to medical students since there is enormous anatomical and functional knowledge required to be memorized. Because of the high capacity of visual memory, an excellent medical education video is expected to tailor to visual aspects, such as those including animated mechanisms and suggested treatments. A recent survey analyzed 800 YouTube videos about Parkinson's disease where only a quarter of the videos were completely or mostly overlapped with the Professional and Patient Organization Forum for Parkinson's.[46] This shows that merely a small portion of educational materials in social media were supervised by professional medical organizations, which raises the reliability of the educational videos from a trustworthy source. An interesting study investigated the use of 600 YouTube videos submitted by plastic surgeons for educating about aesthetic breast surgery.[47] The metrics such as the number of views were used to identify the 10 most frequently viewed videos, in order to statistically compare the characteristics of these popular videos and the unpopular ones. The results found out that 9 out of 10 popular videos included graphic contents, such as 'surgical operation' and 'autopsy', while only 1 out of 10 unpopular videos were found to have such graphic information. This not only generates the idea that the use of graphic contents in a high-subscribed educational video may attract more novice viewers on YouTube but also validates the accuracy of the analytical methods being used for identifying the popular videos on the platform. The platform allows for flexibilities in the visualizations; for example, from general anatomical structure of the body to specific molecular functions at the cellular level. Videos are not confined to the physical and physiological knowledge; they could also be designed for alternative learning methods for problem-based learning. However, it is important for medical students to discriminate the educational videos for their different qualities. Nearly 80% of the content was consumer information, and 67% of the content was for entertainment. While engagement with the social media platform keeps rising, maintaining the quality and accuracy of educational and professional material has become a major concern for the medical society.

Education professionals should assess the merits and cons of different video publishing platforms. YouTube and similar platforms offer fast publication, a massive user base, an intuitive design, extensive feedback mechanisms, and easy search.[48] Some academics worry about losing peer-review from sites like MedEdPortal when educational films are uploaded on social media.

❖ **LinkedIn as a Platform for Professional Networking**

The incorporation of LinkedIn in medical universities gives the opportunity that students can get to know about job postings, internships, and experienced medical professionals. LinkedIn gives the chance to make a group or page for the medical university and confirm the students connected with the recent trends, research, and development in medical fields. The students can get the guidance and experiences for the medical professional, and this can only be possible with the use of LinkedIn. Sharing the experience of practical life with the students on websites such as LinkedIn is important. When students start using social media, it means that they are ready to improve their skills and enhance their knowledge about the medical fields. Since the students that are beginners in medical fields, they are not aware of the international platforms and international students. With the help of LinkedIn, students can get the chance to know about various international medical students and professionals. It

increases the flexibility of the medical professionals in the whole world and also the likelihood of getting jobs and internships in the international market. Another possible benefit of using LinkedIn is that medical students can learn things in a better way from the experiences of the medical professionals. No textbook in the world can give the real experiences of medical life. So, sharing experiences, facts, and a plethora of knowledge on social websites increase the critical thinking power in the students. Most of the time, students are not aware of what type of fields are available in the medical. They solely rely on the information which is given by their university and classmates. With the use of social platforms like LinkedIn, students can know about the different fields of medical and the scope of technical and management in the medical. This helps the students to get specialization in a specific field that further helps to build a potential career. So, there are a plethora of benefits of using social media in medical education as well as more improvement and research is essential to develop more advancement in medical education. Overall, social media in medical education is a fast-growing and changing opportunity for the student population. With the help and proper use of social media, the healthcare system will run in a more effective and organized manner and will contribute to the patient's health and care. This section will give some evidence supporting the notion that social media has a great impact on medical education when it is used in a correct manner.

❖ Edmodo is an Educational Tool

Edmodo is a social media platform that is sometimes referred to as the Facebook of education. The learning platform is secure and provided at no charge. Edmodo enables teachers to administer the platform through a password-protected account for students, facilitating communication between teachers and students outside of the classroom. Students are eligible to participate in the forum only upon receiving an invitation from the teacher. Additionally, the teacher has the ability to distribute materials, videos, quizzes, and polls using Edmodo. This allows students to conveniently provide comments, download resources, and submit assignments from any location, without the need to physically attend class. The Edmodo network facilitates teachers in managing communication with students, colleagues, and parents. This platform is designed and based on a concept that prioritizes the teacher's needs and perspective. Teachers and students allocate significant amounts of time on the platform, both within and outside of the classroom. It is regarded as a potent instrument for educators to augment the learning process beyond the confines of the classroom. The pertinent research characterizes Edmodo as a collaborative tool for classroom use and ranks it as one of the top social networking platforms for educational purposes.[49]

Summary: In the LinkedIn part, credit is given to the well-structured network of professionals and its value to the career development of medical students. Networking and establishing connections within the medical field are emphasized. The student and teaching course dedicated to enhancing medical education in LinkedIn is discussed, showcasing its value in helping medical students excel. This is followed by the YouTube subsection, which discusses its convenience as a channel for information dissemination. The YouTube style of trending is criticized. Twitter is illustrated as a platform for facilitating medical discussions, with doctors and students sharing and getting the latest information through hashtags. Twitter's character limitation function is criticized. The section is divided into three parts, discussing the impact of Twitter, YouTube, and LinkedIn on medical education. Each platform is critically analyzed, highlighting both positive and negative impacts. The

importance of discussing different types of social media platforms in medical education is emphasized.

❖ **Most Appropriate Tools to Enhance Teaching and Learning Experiences**

Table 1: Few examples of social media resources that can be used in medical education

Socia Media Tools	Examples
Blog	Wordpress
Microblog	Twitter
Social networking	
General	Facebook
Profession	Linkedln
Medial	Doximity
Research/academic	ResearchGate
Video/video sharing	YouTube
Collaboration (Wiki)	Wikipedia
Socia bookmarking	Mendeley
Podcasting	iTunesU
Commenting	Pubmed Commons

4. Impact of Social Media on Continuing Medical Education

Continuing medical education is an important aspect for medical professionals after their initial training, as it is essential for them to stay up-to-date and develop new skills and knowledge in their respected career in order to provide high quality care for the patients. Traditionally, medical professionals relied on peer-reviewed journal articles and expert opinions to get the latest information. However, with the rapidly advancing technologies, social media is now playing a crucial role in the distribution and sharing of information about continued medical education. One of the biggest impacts of social media on continued medical education is that it provides tools for efficient and effective learning. From the use of real-time platforms like Twitter to webinars and blogs, social media allows people to share and access information at any time. For example, by using the course hashtag, learners and facilitators can post links to articles, research papers, and other materials that are instantly available to everyone in the group with just one click. Also, different types of social media applications can be used by learners to create content by combining different types of media - text, audio, photos, videos, etc.

Positive Impact: Social media platforms provide quick communication and information exchange between students and professors, both in and out of the classroom.[50, 51] Increasing information access speed boosts learning efficiency. Rapid and simple communication also increased student satisfaction.[52] Social media in education helps pupils transcend geographical barriers. For instance, Cheston et al.[50] found that students may use Twitter to engage with instructors from distant continents and get rapid responses. Students from different universities said social media was more lively than didactic courses during the study. Participants gained confidence in their understanding and were better able to participate in discussions and communicate their perspectives.[51] Cheston et al. (2013) found that this technology increased student engagement and interaction ultimately leading to better

grades. Although Cheston et al.'s study did not score well on the Medical Education Research Study Quality Instrument (MERSQI), which evaluates quantitative educational studies, these findings are promising and warrant further research on social media use.[50] A high-quality study indicated that e-learning was as effective as traditional techniques and that social media will boost its benefits.[50] Social media is popular in education because it can be tailored to students' requirements.[53] (Dabbagh and Kitsantas, 2012). Students develop personalized learning strategies using videos, apps, games, and graphics that match their learning preferences and pace. Students should gradually receive more learning autonomy. Visual learners profit more from YouTube videos than lectures. DiLullo et al.[54] found that students performed better when they controlled their learning.

Negative Impact: Roy et al.'s 2015 review found that social media was the biggest threat to medical professionalism.[55] The profession retained these views, thus many professors were hesitant to include social media in the undergraduate curriculum. Despite concerns regarding professionalism, Roy et al. found no evidence of unprofessional behavior when social media was used properly. Social networking services have been used professionally and got positive reviews from students. However, the literature does not support the claim that social networking is as successful as other media for instruction.[56] Occasional associations have been found between the usage of social media and negative effects on mental and physical well-being.[13] Quantitative study is needed to confirm or deny the negative effects of social media on medical education. Although social media might have detrimental effects, it is nonetheless beneficial for medical students to gain professional discernment. Early unprofessionalism will have fewer consequences than later.

5. Examples of Medical Breakthroughs Facilitated by Social Media

After years of relative obscurity, the medtech sector is attracting a lot of interest from the public and private sectors. This is evident by late 2018, there were nearly 3,000 start-ups using AI to develop new drugs and undertake research in the digitalised healthcare market. This increasing attention and focus on the medtech sector are encouraged by examples of successful medical breakthroughs facilitated by social media. One such example is the precision medicine drug developed by Pfizer, Ibrance, through analysing the genomic database obtained from a start-up research company, Massive Bio. According to analysis by two health information companies, Treato and Advocacy, since 2010, discussions about healthcare and treatment in social media have increased and that might have contributed to the development and rapid approval of that drug. Due to the availability of data from various social media platforms, Pfizer effectively engaged patients at the initial stage of research to understand their demand and the side effect of the treatment. At the same time, the company could continuously monitor patients' response and any adverse reactions in the huge volume of related data that is uploaded onto social media platforms, which substantially shortened the research time in the final stage. This case successfully demonstrates that utilising social media in capturing and analysis of patient emotions and experiences in real time enable the pharmaceutical industry to accelerate drug research and development and take the advantage of the first-come opportunity in the new digital healthcare market. This particular case, along with many other similar examples, indicates how quickly the dynamics in medtech sector have changed with the innovation and breakthroughs facilitated by social media. With the rise of healthcare innovation and the increasing number of digital platforms that allow users to express their opinions on social, ethical and political developments, it's time for policy

makers, regulators and legislators to pay serious attention to the reforms that should be taken to prepare for this new era of digitalized healthcare.

6. Ethical Considerations in Social Media and Medical Education

Social media has the potential to support and enrich medical education, but the responsible and ethical use of these platforms is essential. One of the most important issues in the relationship between social media and medicine is the ethical consideration of maintaining patient confidentiality and privacy. Although this was a concern brought about by the rise of electronic health records and online communication between doctors and patients, social media has added another layer of complexity. Information shared online about patients, including photographs, videos, voice recordings, or even anonymous case studies, may constitute a breach of confidentiality. There are legal and regulatory guidelines in place, such as the Health Insurance Portability and Accountability Act (HIPAA) in the United States, which are designed to protect patient privacy in the digital age. Despite the potential benefits that social media can bring to medicine, it is crucial that we do not jeopardize the trust that patients place in their doctors by sharing information that could lead to the identification of individuals. Another critical ethical concern relates to the use of social media by medical students and professionals. The digital integration of professional and personal lives has inevitably led to some high-profile cases of inappropriate behavior and subsequent disciplinary action.

❖ **Maintaining Patient Confidentiality and Privacy**

By reviewing and using real-life scenarios in the classroom, students can have the opportunity to apply learned knowledge in the teaching session. Such kind of active and reflective learning promotes critical thinking and self-directed study, which could be applied in future practice. Moreover, educators could also take a proactive approach by discussing clinical scenarios involving social media and patients in classroom settings, as suggested by Davis et al.[57] Such interactive and case-based teaching methodology would enhance the engagement of students and help them to understand complex privacy and ethical issues in the context of social media. Therefore, it is important for medical educators to incorporate the teaching of patient confidentiality and privacy issues in digital professionalism into social media activities. This includes the emphasis on the importance of respecting patient privacy, providing guidance on appropriate online behaviors, and raising awareness of the potential risks associated with different social media platforms. Furthermore, the Executive Council of the College of Physicians and Surgeons of Ontario, which regulates the practice of medicine in Ontario, specifies that physicians must not post personal or clinical information about their patients or disclose any information that could reveal a patient's identity without the patient's consent. For example, the Health Insurance Portability and Accountability Act (HIPAA) in the United States establishes national standards to protect individuals' medical records and other personal health information. Under HIPAA, medical professionals who disclose or misuse patient information on social media can face severe penalties, including hefty fines and imprisonment. Social media platforms require individuals to share personal information publicly, and there are increasing concerns regarding the potential threat of privacy breaches. It is crucial for medical educators to recognize their professional obligation to safeguard patient privacy. Failure to do so may result in serious legal and professional implications.

❖ **Ensuring Responsible Use of Social Media by Medical Professionals**

Furthermore, the General Medical Council[58] provides guidelines on how doctors should use social media. For example, it states that a doctor's personal information in the public domain should not be used to identify them in their professional practice and interactions with patients. They should also maintain patient confidentiality and should consider whether they are appropriately qualified to give medical advice, or if they should refer to a colleague or healthcare service in publicly available social media. Therefore, the responsibility lies with medical professionals using social media to keep themselves updated with the latest guidelines. Alongside proper regulation by the medical authority or council, social media can become a safe and beneficial environment for both medical professionals and the public. By exercising professional judgment, we can selectively apply wisdom from different areas of medical practice and consistently transfer these into good patient-interest-related decisions. Medical professionals are expected to conduct themselves online with the same standards of professionalism that apply in any other context, and any material written by authors in a professional capacity should be accurate and honest. Through an appropriate approach in the ethical use of social media, it could provide, facilitate, and deliver efficient and cost-effective ways of engaging with the public and sharing information. Clearly, approaches adopted by governments, the legal system, and the Medical Regulatory body, to strike a balance between the opportunities that social media offer to improve healthcare and the protection of healthcare systems from potential risks and obstructive misuse. There are many possibilities for further research in this area of study, such as investigating the current mechanisms that are in place by the regulatory body and law enforcers to regulate and control the content of social media activity of medical professionals. The impact and effectiveness of these mechanisms, from a research and academic point of view, and maybe the potential ways in which advances in medical research and delivery are being hindered by the regulation of medical professionals on social media. And not forgetting the benefit to the people and the public that can be offered, where a better understanding of the potential medico-legal implications of social media used by healthcare professionals may encourage use in a sensible and efficient manner. These future recommendations and advancements could provide more in-depth information and aid discussions and help maintain the issue at the forefront of topics in society, policy makers, and medical professionals.

❖ **Addressing Potential Conflicts of Interest**

In contrast to some other professions, where it is important to protect the interests of clients or service users, doctors are entrusted with a high level of autonomy and there is a basic expectation that doctors will act in the best interests of their patients at all times. These obligations have been summarized by the General Medical Council[58] as the three 'duties of a doctor', principally that 'you must act in the best interests of patients' and also that 'you must be honest and open and act with integrity'. Social media has not changed the principles of these duties, but the instantaneous, far-reaching and potentially anonymous nature of online communication has generated many new ways in which these duties and the wider principles of medical professionalism might be compromised. GMC guidance for doctors on the use of social media makes it clear that doctors should not post any identifiable patient information and that they should maintain a professional boundary between their personal and professional lives. However, some authors have suggested that these kinds of 'micro-ethical' issues - where the focus is on the actions of individual doctors - perhaps miss the point. They

argue that the real threat of social media lies in the potential to digitally de-professionalize doctors by continuously eroding the traditional hierarchical, exclusive models of medical knowledge and increasing the possibilities for 'like-minded' people to form independent, self-sustaining communities around certain belief systems, marginalising and even alienating those who do not share the same groups of knowledge and that professional digital conduct and behaviour should be seen within the wider context of the impact of digitalisation on healthcare. These debates are reflected within academic writing on the subject, with opinion pieces, empirical research and conceptual papers from a wide range of disciplines, including medicine, law, education, sociology and psychology all contributing to the ongoing discourse about the impacts of social media on medical professionalism and the potential implications for patient safety.

VI. FUTURE TRENDS AND CHALLENGES IN SOCIAL MEDIA AND MEDICAL EDUCATION

There are significant potential benefits to be gained from increased cultural competency, enabling digital health and overcoming cultural and social stigmas about certain medical conditions. Although at present, there is still a paucity of research, initiatives are starting to be developed to assess clinical outcomes resulting from the use of social media and other, as yet, unimagined forms of web-based information sharing on medical education, but the evidence base is limited. Such a new area of study also throws up potential challenges, such as how academic or clinical assessments should be adapted to accommodate the various types of learning that digital environments and more specifically, social media, support. Although more people than ever are now connected worldwide, there remain significant gaps in mobile and internet access, with the most economically deprived regions suffering most. In populations with ageing demographics, access can be hindered by a lack of digital literacy. Additionally, to access three-dimensional and time-based media which supports virtual reality and provides life-like simulations, higher bandwidths are required, and this can lead to the 'digital divide' where the most advanced and interactive learning environments only become available to students and clinicians with the most up-to-date computer hardware and connections. Nevertheless, many medical educators are now of the opinion that the challenges of exploiting web 2.0 and social media in medical education are no longer technological, and the focus has shifted to the cultural change required within both the academic community as well as the health services as the potential components of an integrated digital health system slowly begin to appear in the clinical environment. Personally, I think there is great potential for greater use of social media and other forms of digital information sharing in medical education and in the development of clinical knowledge, especially in engaging and motivating students and allowing learners to interact and share resources. However, I believe that the primary outcome should always be based on what is best for patient care and not just simply about the latest technological advancements. Whether social media could be used as a potential tool within the wider healthcare system remains to be seen, but it would require careful planning and governance to ensure that the solutions developed are fit for purpose and truly reflect the needs of clinicians and patients.

1. Integration of Social Media Into Formal Medical Curricula

Currently, social media is not incorporated into formal medical curricula in most medical schools and colleges around the world.

- Emergency medicine training programs are utilizing social media resources extensively. According to a recent survey conducted on 226 emergency medicine residents from 12 different residency programs, nearly 98% of them utilize social media for learning purposes, dedicating at least 1 hour per week to this activity. Several number of emergency medicine residency programs in the United States and Canada have established their own Twitter accounts, mostly with the assistance of the Academic Life in Emergency Medicine (ALiEM) group.[59]

- Saint Louis University integrated social media into their surgical education program as the majority of respondents used social media heavily, especially Facebook, Instagram, and YouTube. High users saw more advantages and less risks from social media.[60]

- A mini-survey by Cheston et al.[50] published in a medical journal called 'Medical Teacher' showed a positive result. Authors of the survey found that in the United Kingdom, 119 out of 176 (68%) of medical students and doctors were in favor of the incorporation of social media in medical education. They felt social media will improve professional developments amongst medical students and doctors. And 86 out of 177 (49%) thought that medical schools and established doctors should provide social media training. In 2015, authors in 'Innovations in Medical Education: Teaching Technology' mentioned that the number of medical schools in the United States are incorporating social media into formal curricula as horizontal or vertical integration. Horizontal integration means teaching things that apply to everything, while vertical integration involves knowledge from different stages of career. For example, medical students at the University of Central Florida College of Medicine, United States, are helping to write Facebook posts which aim to share knowledge and experiences of the medical school life to the public. The students are encouraged to be innovative and creative in using the technology to reach out and engage with the public as well as to design web-based initiatives. This forms part of a long-term project and it is a good example of allowing students to tailor the direction and development of social media through the method of formalized experiential learning.

2. Impact of Emerging Technologies on Medical Education Via Social Media

A lot of the literature suggests that medical students experience high levels of stress and mental health issues, which have been attributed at least in part to the challenging nature of medical education in terms of the volume of content that needs to be learned and the numerous assessments that students must prepare for. Social media can offer a solution to these issues by facilitating the sharing and exchange of medical information and allowing students to connect with fellow learners and experts in their field, which helps build a collaborative and supportive learning environment. For instance, an online community of practice on a social media site like Facebook, bringing students, academics, and clinicians together, can facilitate the sharing of problem-based learning resources and give students instant access to meaningful and authentic clinical cases, which helps to bridge the gap between theoretical teaching and clinical practice. Studies have shown that students and medical practitioners who engage with social media demonstrate better communication, clinical, and problem-solving skills than those who shy away from engaging with these new technologies.[50, 61] Also, using social media in academics can promote various debates and

research during the whole learning process, which is incredibly important in a healthcare setting where practices and policies change frequently. Real-time information and the shared discussions that social media facilitates can help make students aware of new discoveries, changing practices, and emerging health concerns, ensuring that their learning is up to date and that they are aware of the latest trends in their field.

Social media offers more promise in the future and is now underutilised in higher education, according to Guraya et al.[62] Cheston et al. investigated the impact of incorporating social media technologies into medical courses. According to their research, there was an improvement in exam results along with reflective practice and empathy—two qualities that are critical for physicians.[50] In addition, it was seen that these platforms enhanced student engagement, feedback, and personal growth, hence strengthening the beneficial benefits outlined in Guraya et al.'s research.[62]

While social media has demonstrated several educational benefits, it may also be seen as having both positive and negative aspects. In 2018, the number of monthly Facebook users reached 2.32 billion, and it is expected to keep increasing in the future. We should be mindful of the potentially addictive nature of social media, according to a research by Andreassen et al.[63] the incidence of addiction to social networking sites ranges from 1.6% to 34%. Prolonged and excessive use of social networking sites is known to have detrimental impacts on health, relationships, and face-to-face social interactions. It can even result in symptoms of addiction, similar to those observed with drug misuse. In the UK, e-learning systems that are especially intended for educational reasons have become increasingly popular, as we medical students have witnessed. Therefore, it would be prudent to persist in using these specific platforms, rather than promoting a broader use of social media among these students. According to findings of study in Jordan, medical and dentistry students are generally reluctant to utilize social media to research medical topics.[64] Cultural perceptions that social media is primarily used for entertainment and socialization may help to explain such reluctance.[64]

Incorporating a new teaching method into medical educational courses will inevitably present difficulties, similar to any other new technique. Web-based problem-based learning (PBL) sessions were reported by Raupach et al.[65] to be more time-consuming than in-person PBL sessions, with no discernible difference in examination outcomes. Furthermore, the process of incorporating education onto platforms that are not specifically designed for this purpose can be laborious and time-consuming. In addition, privacy and security concerns have been raised, as outlined by Smith,[66] where students expressed worries about the blending of their social and professional lives. Occasionally, students found it necessary to establish distinct social media profiles to address this issue.

3. Addressing the Digital Divide in Access to Medical Education

Information and communication technology can meet the rapidly growing need for medical education in all corners of the world. In fact, distance learning through digital technology is becoming the vehicle of choice for medical education at many institutions. However, a significant obstacle to this approach gaining traction is the digital divide. Students and educators in low and middle-income countries, particularly in remote and rural areas, are disproportionately affected by the lack of access to digital resources and broadband

infrastructure. In a digital age where evidence-based medicine relies on high-quality digital resources, students educated in environments without the same access may be at a disadvantage to their peers both in the same country and that have had the opportunity to study medicine elsewhere in the world. Additionally, as the digital age progresses, the need for a common international standard of health informatics education is being recognized. This contributes towards the impetus to address the digital divide and ensure that all students, regardless of nationality or location, are able to access and gain expertise in digital health and medicine in lower incomes as well as the vast geographic differences observed in the current provision of medical education. Programs have been devised in the last decade to support e-learning and access to digital resources in low and middle-income countries, in particular to support the standard of care in those countries. For example, students at University College London established 'Project SamosAid' in 2004, aiming to provide computer stations and digital education resources for students in rural Africa. Additionally, the World Health Organization (WHO) initiated the Global Digital Health Partnership and released a Global Strategy for Digital Health 2020-2024 reinforcing the need for improved digital health in development and in low and middle-income countries. The digital divide in high-income countries should not be overlooked. Although there may be higher access to the internet, computer, and digital resources, there are still communities and social groups with reduced access compared to the wealthier and urban counterparts. This may apply to medical education provided in those communities and contribute towards inequalities that can exist within a country in the provision of great emphasis needed on the funding, development, and research of digital health and medicine.

VII. SOCIAL MEDIA USAGE IN MEDICAL EDUCATION CONTEXT TO SAUDI ARABIA

Social media is used widely in this nation, it is plausible to argue that social media might be used to raise the standard of healthcare in the Kingdom of Saudi Arabia. The results from a cross-sectional study demonstrated that a significant portion of Saudi Arabia's healthcare quality workers used social media networks to enhance education, with YouTube being the most popular medium.[67] According to the findings, social media may be helpful in gauging the quality of healthcare provided in the Kingdom of Saudi Arabia. Medical schools could enhance the integration of social media into their educational practices by creating initiatives and promoting the use of social media among their teachers and students.[68] Till date none of the universities have officially integrated social media as a means of learning aid in Saudi Arabia.

VIII. CONCLUSION

The development of internet-based life assumes a significant job in the ordinary life of the understudy just as the instructors. In numerous clinical schools with showed asset limitations, it's really observed as a feasible and powerful way. It can both improve the understudy's learning experience and encourage dynamic commitment as thoroughly examine. There are many social media platforms and applications such as Facebook, YouTube, Skype, Google+, Pinterest, Twitter, MySpace, WhatsApp, Snapchat, Instagram, LinkedIn, etc. However, each has different roles and significance in healthcare and medical education. The impact of social media on clinical education is summarized and the importance of further research and investigation in this field is emphasized. There are challenges in implementing social media

in personal and public life, and there are no current guidelines addressing the ethical use of social media in clinical education. The establishment of electronic health records in primary care settings should include practices to support security. The end summarizes the effect of web-based life on clinical training and emphasizes the significance of further research and investigation in this field, critical thinking and dynamic reasoning, using social and community-oriented restorative and grown-up learning standards. Beside difficulties in executing the utilization of web-based life in individual and public activity, there are no ongoing and specific rules address the moral utilization of online life in clinical instruction to manage both clinical understudies and scholastics. For example, there is no norm to assist with sifting and deciphering web-based life data in showing days. With the quick improvement of innovation and the commonness of internet-based life, various understudies and educators who are early stage embraces may not used the social innovations with a completely unprecedented related the creating age in future. Crafted by research in India shows that presentations to web-based life on a school in government-funded training settings can help the two understudies and their instructors in the learning technique. Specifically, they found that foundation of electronic wellbeing records in essential consideration settings should consistently join procedures to refresh practice society in supporting the secure. Social Media impact on medical education is a real-time report and research paper which will help healthcare professionals, medical educators, students, and research researchers around the world so as to facilitate and demonstrate the advantages of open, online stages and casual learning systems in social insurance and medicinal services experts' training and improvement.

1. Summary of the Impact of Social Media on Medical Education

The various forms of social media have fundamentally changed the way medical education is approached. From sharing research and discussing surgery to crowd sourcing diagnoses and networking with professionals and students all around the world, learning through a digital medium has made the community of healthcare even more intertwined. Although medical students and professionals have the trust of prestigious titles such as that of the 'doctors' or 'surgeons', these do not and should not insinuate that the pursuit of knowledge should ever come to term. The knowledge within the medical sphere is ever-changing and growing, and with newer contributions from fledgling researchers beginning to impact the scientific community, it is important to have the rigidity and adaptability of knowledge that can be offered through social media. Medical students are able to learn how to use technological tools in ways that are educational and beneficial. For undergraduates, social media provides a strong network of educational support and guidance. Critical thinking can be developed through social media, as students need to research and evaluate the information that is shared. Learning becomes student-led, and collaboration with peers will increase in this digital age. By combining educational studies with social media, healthcare graduates going into further education can expect to be more literate in this field. With the increase in self-regulatory guidance surrounding digital professionalism and the advent of 'SoMe' - standing for 'social media', the future looks bright for social media's attitudes and applications in medical education. Professional development, research outputs, and qualitative feedback are becoming more accessible. The privilege of speaking with clarity and brevity in a platform that provides unprecedented opportunity in professional growth and networking is not overlooked, and medical educators are seen to be more active online. It is an extremely exciting time to be part of an era that promotes digital engagement and interactive learning in

such an adaptive and fast-moving profession. I hope to inspire, educate, and promote a shared vision of the potential that - when used appropriately - technology, combined with experience and research, can provide a vastly beneficial medium of information and knowledge sharing. By understanding recent changes and advances in medical education and introducing novel concepts to e-learning, the future is historical. I hope to further develop my passion for medical education and educational research through the use and understanding of technological methods. Ultimately, medical education through social media is more than just about gaining knowledge. It's about learning how to think and receive knowledge, developing critical skills for continually evaluating that knowledge, and preparing for professional digital literacy. Social media provides a gateway to great education, furthering prosperity and intellectual growth for the future.

2. Importance of Further Research and Exploration in this Field

Throughout the monograph, we have seen that social media is indeed having a profound impact on medical education. We have also noticed that new technologies have created a platform for the open source communities to develop and share educational resources through the internet. We have seen that social media's importance in collecting and sharing knowledge, creating areas for discussions, collaborations, and debate, and social media's role in the future of medical education. But we should not get too carried away with that. Yes, social media gives some immediate answers. But there are very serious risks attached to it. Facebook, Twitter, Snapchat, Instagram, and other social media applications are designed to be addictive. We all know that medical students should be able to use technology to access journals and research, to update themselves about new things, and surely to communicate with colleagues. But there is a need for a moral compass. So whether we like it or not, social media is going to be more and more integrated into our medical education. But it is unlikely to replace the need for a teacher. And also, social networks will never replace the connection that we found in person. So being a doctor, I suggest that we should all embrace the maximum of what is available. But at the same time, we all need to develop awareness of the risks that are linked with it. Because when things go wrong with social media in medical education, they could go wrong very quickly in a very big way. So we don't take any risks with our patients' safety and privacy. But now and in the future, ongoing research in the field of social media and information to get positive outcomes will translate into advances in medical education. Social media is just the tool that is going to have a significant impact in the field of medical education. Positive and innovative experiments and research in the field of social media are anticipated to build up the evidence for the development of curricula and also to develop training programs, so as to keep pace with the ever-evolving landscape of medical education, which is also getting influenced by the fast pace of digitalization of information. It's important for research to understand how these changes, whether research confirms what's often assumed already or it brings out that little surprise changes to new changes in our knowledge and understanding. And it's also important for the development in its use in the promotion of public regarding to health. Because the desire for information in the operators and population as a whole is going to be provided by the new ways in which the population is going to learn about disease, disseminate data, and health and so on. Social media is going to play a major role in the provision of data for the strategies used by medics. And it's also going to help and boost new ways in which medical prevention is going to be provided. And our understanding of the assumptions and practices promoting and maintaining health can also be aligned and developed by these changes.

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